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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/850,203	05/08/2001	Yuji Saito	101213-00009	9728

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EXAMINER

DOVE, TRACY MAE

ART UNIT PAPER NUMBER

1745

DATE MAILED: 10/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/850,203

Applicant(s)

SAITO ET AL.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2,3,5 and 11-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3,5 and 11-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This Office Action is in response to the communication filed on 8/10/06. Applicant's arguments have been considered, but are not persuasive. Claims 2, 3, 5 and 11-17 are pending.

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/10/06 has been entered.

#### ***Claims Analysis***

As shown in Figure 3 of the present specification and described at paragraph [0030], lead 8 electrically connects the gas diffusion electrodes 3 associated with the passages 4 and 6 to each other, and connects them to an external circuit. Similarly, lead 9 electrically connects the gas diffusion electrodes 3 associated with the passages 5 and 7 to each other, and connects them to an external circuit. Thus, the casing must contain leads (interconnects) in order to retrieve the electrochemical power from the cell. The fuel cell must have an external circuit in order for the electrochemical reaction to occur.

#### ***Claim Objections***

Claims 14-16 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2, 3, 5 and 11-17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zwick et al., US 4,499,663.

Zwick teaches a method of fabricating a monolithic core for a solid oxide fuel cell. The solid oxide fuel cell comprises cathode and anode materials sandwiching electrolyte material there between. The solid oxide fuel cell has a plurality of substantially parallel core passageways alternately having respectively the inside faces thereof with only the anode material or with only the cathode material exposed. The method consists of building up the electrolyte, anode and cathode materials by depositing each material individually. Each material deposit is sequentially applied for one cycle and where the depositing cycle is repeated many times until the material buildup is sufficient to formulate the core (abstract). A specific feature of Zwick is making the solid oxide fuel cell core by building up the separate material layers that form the core in a multiple step sequential manner with minute or thin deposits of each material being applied endwise to the wall that is being fabricated, or axially along the passageways being formed for confining the fuel and oxidant designed to flow through the fuel cell core (3:66-4:5). The method allows core passageway arrays of virtually any complicated cross sections to be formed (4:22-25). The complicated passageway core arrays extend axially (4:38-41). The fuel passageways are formed with only anode material defining the exposed passageway walls and

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the oxidant passageways are formed with only cathode material defining the exposed passageway walls (7:6-11). The electrode materials are applied in a material-layer-by-material-layer buildup (8:64) using a material discharging apparatus such as painting, spraying, vapor deposition or the like (9:17-19). In another embodiment of Zwick, the respective deposits of the cathode and anode by using the respective templates would be the same while the deposits of the electrolyte between the buildups of the cathode and anode might be by jet spraying (without the blocking templates) (10:5-13). The gas passageways have cross dimensions slightly less across the opening of the passageway (non-uniform) (9:48-61). Zwick teaches the core 14 is comprised solely or exclusively of the active anode, cathode, electrolyte *or* interconnect materials, respectively (8:39-44).

Regarding at least claims 2 and 13, Zwick does not show an example of a tubular casing comprising high polymer solid electrolytic material surrounding said pair of gas diffusion electrodes.

However, Zwick at least suggests that the gas diffusion electrodes may be surrounded by electrolytic material. Zwick states the gas diffusion electrodes may be separated by either or both an electrolyte wall portion or an interconnect wall portion. Zwick teaches cells having electrolyte separating a gas diffusion anode from a gas diffusion cathode are connected in parallel, while cells having interconnect separating a gas diffusion anode from a gas diffusion cathode are connected in series (7:5-65). Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Zwick suggests that the placement of electrolyte or interconnect between gas diffusion electrodes

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depends on the desired connection (series or parallel). One of skill would have known that fuel cells may be connected in series or parallel.

Regarding at least claim 11, Zwick does not explicitly state at least one gas passage is formed by mis-registering of neighboring layers of material of the material deposits of the electrodes.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Zwick teaches virtually any complicated cross sections may be formed using the material-layer-by-material layer method (4:22-25). The complicated passageway core arrays extend axially (4:38-41). Therefore, Zwick at least suggests the claimed invention because it teaches a gas passage having virtually any complicated cross section may be formed. One of skill would have known that the method of Zwick could have been used to produce the mis-registered gas passageway of the claimed invention.

### ***Response to Arguments***

The objection to claims 14-16 is maintained. Applicant asserts while claims 14-16 specify that the gas passages are only (or solely) defined by the corresponding gas diffusion electrode, due to the “open” nature of the claim, presently pending claim 2 maintains the broader feature of the gas diffusion electrodes defining more than one gas passage, e.g., a second fuel gas passage or a second oxidizing gas passage. However, claims 14-16 specifically refer to the gas diffusion electrodes defined by claim 2. Claim 2 recites “a first gas diffusion electrode completely defining a fuel gas passage” and “a second gas diffusion electrode completely defining an oxidizing gas passage”. Claims 14 and 16 recite “the first gas diffusion electrode...the fuel gas passage” and claims 15 and 16 recite “the second gas diffusion

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electrode...the oxidizing gas passage". Thus claims 14-16 cannot be referring to any other possible gas passages encompassed by the "open" language of claim 2, but must be referring to the recited fuel gas passage defined by the first gas diffusion electrode and the recited oxidizing gas passage defined by the second gas diffusion electrode of claim 2.

The 35 U.S.C. 112, 2<sup>nd</sup>, rejection of claim 17 is withdrawn.

Applicant's arguments filed 8/10/06 with respect to Zwick are moot in view of the new ground(s) of rejection. Zwick teaches the passageways 20 for the fuel are formed with only anode material 30 defining the exposed passageway walls while the passageways 26 for the oxidant are formed with only cathode material 32 defining the exposed passageway walls. The passageway walls may be separated *by either or both* an electrolyte wall portion 36 or an interconnect wall portion 38 (7:6-19). Zwick teaches the core 14 is comprised solely or exclusively of the active anode, cathode, electrolyte *or* interconnect materials, respectively (8:39-44). Thus, Zwick suggests the anode and cathode may be surrounded by only electrolyte material 36.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

October 23, 2006



**TRACY DOVE**  
**PRIMARY EXAMINER**